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STATEMENT OF ACCURACY OF TRANSLATION OF PRIORITY DOCUMENT (37 C.F.R. §1.55(A))

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SIR:

I, the below named translator, hereby state:

My name and post office address are as stated below;

That I am knowledgeable in the English language, and in Japanese, which is the language of the Japanese patent application filed on July 18, 1997 from which priority is claimed for the above-identified application.

The priority document P09-193589 is attached.

I hereby state that the attached translation of the priority document that I have prepared is accurate.

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[Name of Document] SPECIFICATION

[Title of the Invention] RECEIVING APPARATUS, RECEIVING METHOD, TRANSMITTING APPARATUS, TRANSMITTING METHOD, AND TRANSMISSION MEDIUM

[Claims]

[Claim 1] A receiving apparatus for receiving an image signal transmitted from a transmitting end, said receiving apparatus comprising:

receiving means for receiving said image signal;

output means for outputting the image signal received by said receiving means to a display;

extracting means for extracting an EPG added to the image signal received by said receiving means;

alteration means for altering the display format of the EPG when the EPG is displayed on said display, in accordance with predetermined information; and

second output means for outputting the EPG altered by said alteration means to said display.

[Claim 2] A receiving apparatus according to Claim 1, wherein said predetermined information represents a broadcasting station providing the EPG.

[Claim 3] A receiving apparatus according to Claim 1, wherein said predetermined information represents a broadcasting station transmitting said image signal, which is being received by said receiving means.

[Claim 4] A receiving apparatus according to Claim 1, further comprising recording means for recording information representing a predetermined broadcasting station, wherein said predetermined information represents the predetermined broadcasting station recorded in said recording means.

[Claim 5] A receiving apparatus according to Claim 1, wherein said alteration means alters the order of data constituting the EPG to be displayed in accordance with said predetermined information.

[Claim 6] A receiving apparatus according to Claim 1, wherein said alteration means displays data constituting the EPG so that part of the data is emphasized in accordance with said predetermined information.

[Claim 7] A receiving apparatus according to Claim 1, wherein said alteration means displays data constituting the EPG so that additional information is added to part of the data in accordance with said predetermined information.

[Claim 8] A receiving method for receiving an image signal transmitted from a transmitting end, said receiving method comprising:

a receiving step for receiving said image signal;

an output step for outputting the image signal received in said receiving step to a display;

an extracting step for extracting an EPG added to the image signal received in said receiving step;

an alteration step for altering the display format of the EPG when the EPG is displayed on said display, in accordance with predetermined information; and

a second output step for outputting the EPG altered in said alteration step to said display.

[Claim 9] A transmission medium for transmitting a computer program used in a receiving apparatus for receiving an image signal transmitted from a transmitting end,

in which said computer program comprises:

a receiving step for receiving said image signal;

an output step for outputting the image signal received in said receiving step to a display;

an extracting step for extracting an EPG added to the image signal received in said receiving step;

an alteration step for altering the display format of the EPG when the EPG is displayed on said display, in accordance with predetermined information; and

a second output step for outputting the EPG altered in said alteration step to said display.

[Claim 10] A receiving apparatus for storing a computer program transmitted from a transmission medium according to Claim 9, and using said computer program to receive an image signal.

[Claim 11] A transmitting apparatus for transmitting an image signal to a receiving end, said transmitting apparatus

comprising:

first generating means for generating said image signal;

second generating means for generating an EPG;

third generating means for generating information representing a broadcasting station providing the EPG;

adding means for adding the EPG generated by said second generating means and said information representing the broadcasting station, which is generated by said third generating means, to said image signal generated by said first generating means; and

transmitting means for transmitting to the receiving end the signal obtained by adding the EPG and said information representing the broadcasting station to said image signal.

[Claim 12] A transmitting method for transmitting an image signal to a receiving end, said transmitting method comprising:

a first generating step for generating said image signal;

a second generating step for generating an EPG;

a third generating step for generating information representing a broadcasting station providing the EPG;

an adding step for adding the EPG generated in said second generating step and said information representing the

broadcasting station, which is generated in said third generating step, to said image signal generated in said first generating step; and

a transmitting step for transmitting to the receiving end the signal obtained in said adding step by adding the EPG and said information representing the broadcasting station to said image signal.

[Claim 13] A transmission medium for transmitting a computer program used in a transmitting apparatus for transmitting an image signal to a receiving end, wherein said computer program comprises:

a first generating step for generating said image signal;

a second generating step for generating an EPG;

a third generating step for generating information representing a broadcasting station providing the EPG;

an adding step for adding the EPG generated in said second generating step and said information representing the broadcasting station, which is generated in said third generating step, to said image signal generated in said first generating step; and

a transmitting step for transmitting to the receiving end the signal obtained in said adding step by adding the EPG and said information representing the broadcasting station to said image signal.

[Claim 14] A transmitting apparatus for storing a computer program transmitted from a transmission medium according to Claim 13, and using said computer program to transmit an image signal.

[Detailed Description of the Invention]

[0001]

[Industrial Field of the Invention]

The present invention relates to receiving apparatuses, receiving methods, transmitting apparatuses, transmitting methods, and transmission media, and in particular, to a receiving apparatus, a receiving method, a transmitting apparatus, a transmitting method, and a transmission medium which are used for receiving and transmitting an image signal with an EPG.

[0002]

[Description of the Related Art]

Recently, a system has become known in which a television broadcast signal with, e.g., information called an "EPG (electronic program guide)" is transmitted and the signal is received and displayed by domestic receiving apparatuses.

[0003]

In this system, when program information forming the EPG is displayed, the program information can be displayed in the order of broadcasting stations designated by a user.

The "StarSight" (service mark) and the "GuidePlus+" (service mark) are known examples of this system in North America.

[0004]

In the case where a particular broadcasting station transmits EPG including program information from all broadcasting stations, a receiving end treats program information from the particular broadcasting station as equivalent to program information from the other broadcasting stations. Thus, the particular broadcasting station cannot benefit by providing the information on all the programs.

[0005]

In addition, when the user, who is watching a program from a predetermined broadcasting station, recognizes a program to be broadcast after the present program, program information is displayed in the order of broadcasting stations initially designated by the user, which requires the user to spend time finding a program from the desired broadcasting station.

[0006]

In view of the foregoing circumstances, the present invention has been made, and its object is to display program information so as to reflect an intention of a sponsor for the program information and be easily usable by a user.

[0007]

[Problems to be Solved by the Invention]

A receiving apparatus as set forth in Claim 1 includes: receiving means for receiving the image signal; first output means for outputting the image signal received by the receiving means to a display; extracting means for extracting an EPG added to the image signal received by the receiving means; alteration means for altering the display format of the EPG when the EPG is displayed on the display, in accordance with predetermined information; and second output means for outputting the EPG altered by the alteration means to the display.

[0008]

A receiving method as set forth in Claim 8 includes: a receiving step for receiving the image signal; an output step for outputting the image signal received in the receiving step to a display; an extracting step for extracting an EPG added to the image signal received in the receiving step; an alteration step for altering the display format of the EPG when the EPG is displayed on the display, in accordance with predetermined information; and a second output step for outputting the EPG altered in the alteration step to the display.

[0009]

A transmission medium as set forth in Claim 9 transmits

a computer program including: a receiving step for receiving the image signal; an output step for outputting the image signal received in the receiving step to a display; an extracting step for extracting an EPG added to the image signal received in the receiving step; an alteration step for altering the display format of the EPG when the EPG is displayed on the display, in accordance with predetermined information; and a second output step for outputting the EPG altered in the alteration step to the display.

[0010]

A transmitting apparatus as set forth in Claim 11 includes: first generating means for generating the image signal; second generating means for generating an EPG; third generating means for generating information representing a broadcasting station providing the EPG; adding means for adding the EPG generated by the second generating means and the information representing the broadcasting station, which is generated by the third generating means, to the image signal generated by the first generating means; and transmitting means for transmitting to a receiving end the signal obtained by adding the EPG and the information representing the broadcasting station to the image signal.

[0011]

A transmitting method as set forth in Claim 12 includes: a first generating step for generating the image

signal; a second generating step for generating an EPG; a third generating step for generating information representing a broadcasting station providing the EPG; an adding step for adding the EPG generated in the second generating step and the information representing the broadcasting station, which is generated in the third generating step, to the image signal generated in the first generating step; and a transmitting step for transmitting to the receiving end the signal obtained in the adding step by adding the EPG and the information representing the broadcasting station to the image signal.

[0012]

A transmission medium as set forth in Claim 13 transmits a computer program including: a first generating step for generating the image signal; a second generating step for generating an EPG; a third generating step for generating information representing a broadcasting station providing the EPG; an adding step for adding the EPG generated in the second generating step and the information representing the broadcasting station, which is generated in the third generating step, to the image signal generated in the first generating step; and a transmitting step for transmitting to the receiving end the signal obtained in the adding step by adding the EPG and the information representing the broadcasting station to the image signal.

[0013]

According to a receiving apparatus as set forth in Claim 1, a receiving method as set forth in Claim 8, and a transmission medium as set forth in Claim 9, an image signal is received, the received image signal is output to a display, EPG added to the received image signal is extracted, the display format of the EPG when it is displayed on the display is altered in accordance with predetermined information, and the altered EPG is output to the display. For example, an image signal sent from a broadcasting station is received, the received image signal is output to a display such as a CRT, an EPG added to the received image signal is extracted, the display format of the EPG when it is displayed on the display is altered in accordance with information representing a broadcasting station providing the EPG, and the altered EPG is output to the CRT as a display.

[0014]

According to a transmitting apparatus as set forth in Claim 11, a transmitting method as set forth in Claim 12, and a transmission medium as set forth in Claim 13, an image signal is generated, EPG is generated, information representing a broadcasting station providing the EPG is generated, the generated EPG and the generated information representing the broadcasting station are added to the

generated image signal, and the signal obtained by adding the EPG and the information representing the broadcasting station to the image signal is transmitted to a receiving end. For example, a television camera etc. is used to generate an image signal, an EPG as information representing programs is generated, the generated EPG and the generated information representing the broadcasting station are added to the generated image signal, and the signal obtained by adding the EPG and the information representing the broadcasting station to the image signal is transmitted to a receiving end via an antenna.

[0015]

[Description of the Embodiments]

Fig. 1 is a block diagram showing an embodiment of a transmitting apparatus according to the present invention.

[0016]

In Fig. 1, an optical image and sound of a subject is input to a television camera 1, and the television camera 1 generates and outputs the corresponding image signal and sound signal. A signal to which a sound signal has been added will be simply referred to as an "image signal" below.

[0017]

An editor 2 (first generating means) records the image signal output from the television camera 1, and properly combines a plurality of recorded image signals to generate

an image signal constituting one program.

[0018]

An EPG generator 4 (second generating means) generates and outputs an EPG (whose details will be described below) composed of program information from a plurality of broadcasting stations.

[0019]

A provider-tag generator 5 (third generating means) generates tag information on broadcasting stations as EPG providers, such as "ASAHI".

[0020]

A combining unit 3 (adding means) adds the EPG output from the EPG generator 4 and the provider tag output from the provider-tag generator 5 to the image signal output from the editor 2, and outputs it.

[0021]

The combining unit 3 superposes, for example, the EPG and the provider tag on each other in a vertical retrace blanking period of the image signal, and outputs it.

[0022]

A transmitter 6 (transmitting means) modulates a carrier in accordance with the image signal output from the combining unit 3, and amplifies the power of the carrier.

[0023]

An antenna 7 transmits the carrier output from the

transmitter 6 to domestic receivers.

[0024]

Next, the operation of the above-described embodiment will be described with reference to the flowchart shown in Fig. 2.

[0025]

Fig. 2 shows a flowchart illustrating one process executed by the transmitting apparatus shown in Fig. 1.

[0026]

In step S1 of this process, an image signal output from the television camera 1 is supplied to the editor 2, in which it is once recorded and the image is subsequently edited so as to form a program having a predetermined length. The edited image signal is output to the combining unit 3.

[0027]

In step S2, the EPG generator 4 generates and supplies an EPG to the combining unit 3. In step S3, the provider-tag generator 5 generates and supplies a provider tag to the combining unit 3.

[0028]

In step S4, the EPG supplied from the EPG generator 4 and the provider tag supplied from the provider-tag generator 5 are added to the image signal supplied from the editor 2. In other words, the combining unit 3 initially adds the provider tag supplied from the provider-tag

generator 5 to the EPG supplied from the EPG generator 4.

[0029]

Fig. 3 shows one example of the EPG, to which the provider tag has been added. In this example, at the start of the EPG, "ASAHI" as a provider tag is disposed between two pairs of brackets indicating the type of information. In other words, just after <PROVIDER TAG> indicating the start and type of information, provider tag "ASAHI" is disposed, and </PROVIDER TAG> indicating the end of information is disposed.

[0030]

Subsequently, BROADCAST FILE 1 to BROADCAST FILE 6 representing programs are disposed. For example, concerning broadcast file 1, <BROADCAST FILE 1> indicating the type and start of information is displayed. Next, subsequently to <BROADCAST DATE> indicating a broadcast date, the date on which the broadcast file 1 is broadcast: December 24, 1997, 16:00-16:10; and </BROADCAST DATE> representing the end of information are disposed. Subsequently, "SOGO" indicating a broadcasting station is disposed between <BROADCASTING STATION> and </BROADCASTING STATION>, and "NEWS" indicating a program name is disposed between <PROGRAM NAME> and </PROGRAM NAME>. In the same manner, the broadcast file 2 to the broadcast file 6 are disposed.

[0031]

The EPG to which the provider tag has been added is superposed on the image signal, for example, its vertical retrace blanking period, by the combining unit 3. The superposed image signal is output to the transmitter 6.

[0032]

In step S5, the transmitter 6 modulates a carrier in accordance with the image signal, and amplifies and supplies its power to the antenna 7 for transmission. After that, it ends processing.

[0033]

Next, the structure of a receiving apparatus for receiving the image signal transmitted by the above-described transmitting apparatus will be described below.

[0034]

Fig. 4 is a block diagram showing an embodiment of a receiving apparatus according to the present invention.

[0035]

In Fig. 4, an antenna 20 is used to receive electric waves transmitted by the antenna 7 at the transmitting end. A TV tuner 21 (receiving means, extracting means) extracts an image signal by extracting a predetermined frequency (broadcasting station) signal from the electric waves received by the antenna 20 and demodulating it, and the TV tuner 21 extracts an EPG included in the image signal.

[0036]

A tag extractor 22 extracts a tag (provider tag) included in the EPG extracted by the TV tuner 21, and outputs the obtained provider tag and EPG.

[0037]

A frame memory 23 (output means, second output means) combines the image signal from the TV tuner 21 and the EPG output from a controller 25, or selects either one, and outputs it to a cathode-ray tube (CRT) 24 for display.

[0038]

The CRT 24 displays the image signal output from the frame memory 23.

[0039]

The controller 25 includes: a CPU 25a (alteration means) for controlling other units; a ROM 25b in which predetermined programs to be executed by the CPU 25a and data are stored; a RAM 25c in which, when the CPU 25a performs predetermined computation, data and programs which are being used for the computation are stored; and an interface (IF) 25d for converting the format of data when the data is transmitted to or received from an external apparatus.

[0040]

An input unit 26 is operated when a user provides a predetermined input (for example, input for selecting a receiving channel).

[0041]

In the above-described embodiment, an amplifier, a speaker, etc. for reproducing a sound signal included in the image signal received by the TV tuner 21 are omitted for a simplified description.

[0042]

The operation of the above-described embodiment will be described below with reference to the flowchart shown in Fig. 5.

[0043]

Fig. 5 shows the flowchart, which illustrates a process executed in the controller 25 shown in Fig. 4.

[0044]

When the process shown in Fig. 5 is executed, in step S10, the CPU 25a in the controller 25 determines whether or not a predetermined input for displaying an EPG has been provided from the input unit 26. As a result, if it is determined that the predetermined input has not been provided (NO), the process returns to step S10, in which the same processing is repeatedly performed until the predetermined input is provided. If it is determined that the predetermined input has been provided (YES), the process proceeds to step S11.

[0045]

In step S11, the CPU 25a specifies a broadcasting

station that provides an EPG by referring to the provider tag (e.g., "ASAHI" etc.) extracted by the tag extractor 22. The process proceeds to step S12.

[0046]

In step S12, the CPU 25a extracts from the EPG supplied from the tag extractor 22, program information from the broadcasting station corresponding to the provider tag.

[0047]

When it is assumed that the provider tag is "ASAHI", the broadcast file 6 shown in Fig. 3 is extracted as extractive program information. Such program information is transmitted for a one day requirement. Accordingly, in step S12, a plurality of broadcast files are extracted excluding the broadcast file 6.

[0048]

In step S13, the CPU 25a sets the program information (broadcast file) from the broadcasting station corresponding to the provider tag extracted in step S12 in the frame memory 23 in its top row in the order of time.

[0049]

In step S14, the CPU 25a sets other program information (program information from broadcasting stations excluding the broadcasting station corresponding to the provider tag) in the frame memory 23 in the order of channels.

[0050]

Fig. 6 is an example of an image displayed on the CRT 25 as a result of processing in steps S13 and S14. In this example, the programs corresponding to the provider tag "ASAHI", namely, "SUIYO SUSPENSE", "RYORI", and "SASURAI KEIJI KANJO-HEN" are displayed in the top row, with them magnified and the background color changed. Under the programs, "NE (NEWS)" and "ASAGA MAIRIMASHITA" are displayed. Under them, programs from broadcasters "KYOIKU" and "NIPPON" are displayed in a format identical to that in the above case.

[0051]

In the case where the above-described processing (display alteration in accordance with the provider tag) is not performed, an image as shown in Fig. 7 is displayed. In this image, program information from broadcasting stations is displayed in the order of the following channels: "SOGO" (channel 1), "KYOIKU" (channel 3), "NIPPON" (channel 4), "TOKYO" (channel 6), "FUJI" (channel 8), and "ASAHI" (channel 10). In the same format, information on all broadcasting stations is displayed.

[0052]

Returning to Fig. 5, in step S15, the CPU 25a determines whether or not a predetermined input for ending EPG display has been provided from the input unit 26. As a result, if it is determined that the predetermined input has

not been provided (No), the process returns to step S15, in which the same processing is repeatedly performed. If it is determined that the predetermined input has been provided (YES), the process ends (END).

[0053]

According to the above-described embodiment, a transmitting apparatus adds to an image signal, a provider tag indicating broadcast stations that provide EPGs, and a receiving apparatus displays in a top row, program information from the broadcast station corresponding to the provider tag so that the program information is emphasized. Thus, a possibility in which a user watches the programs from the broadcasting station can be increased.

[0054]

According to the above-described embodiment, part of the program information is displayed as shown in Fig. 6. However, needless to say, similarly to the case shown in Fig. 7, information on the whole of the program information may be displayed.

[0055]

In the case where the number of broadcasting stations providing an EPG is two, two type of provider tag are transmitted. In this case, for example, as shown in Fig. 8, program information corresponding to the two broadcasting stations may be displayed in top rows.

[0056]

Fig. 9 is a block diagram showing a second embodiment of a receiving apparatus according to the present invention. In Fig. 9, components corresponding to those shown in Fig. 4 are denoted by identical reference numerals for omitting descriptions.

[0057]

Compared with the embodiment shown in Fig. 4, the tag extractor 22 is excluded in the second embodiment. In a ROM 25b in a controller 25, a table on the correspondence between frequencies and channel identifications (Ids) is stored as shown in Fig. 11. The structures of other components are identical to those shown in Fig. 4.

[0058]

The operation of the receiving apparatus shown in Fig. 9 will be described below, with reference to the flowchart shown in Fig. 10.

[0059]

Fig. 10 is a flowchart illustrating a process executed in the controller 25 shown in Fig. 9.

[0060]

When the process is executed, in step S20, a CPU 25a determines whether or not a predetermined input for displaying an EPG has been provided from an input unit 26. As a result, if it is determined that the predetermined

input has not been provided (NO), the process returns to step S20, in which the same processing is repeatedly performed until the predetermined input is provided. If it is determined that the predetermined input has been input (YES), the process proceeds to step S21.

[0061]

In step S21, the CPU 25a acquires the frequency of a signal that is being received by a TV tuner 21. The process proceeds to step S22, in which the broadcasting station ID corresponding to the acquired frequency is retrieved from the ROM 25b.

[0062]

Fig. 11 shows the table indicating the correspondence between frequencies and broadcasting station (channel) Ids. In the table, a frequency of 90 to 96 MHz corresponds to broadcaster "SOGO", a frequency of 102 to 108 MHz corresponds to broadcaster "KYOIKU", a frequency of 170 to 176 MHz corresponds to broadcaster "NIPPON", a frequency of 192 to 198 MHz corresponds to broadcaster "FUJI", and a frequency of 204 to 210 MHz corresponds to broadcaster "ASAHI".

[0063]

In the case where the receiving frequency of the TV tuner 21 is, for example, 207 MHz, the CPU 25a acquires "ASAHI" as a broadcasting station (channel) ID.

[0064]

In step S23, the CPU 25a extracts the program information corresponding to the broadcasting station ID acquired in step S22 from EPG data supplied from the TV tuner 21. The process proceeds to step S24.

[0065]

In step S24, the CPU 25a enlarges the program information extracted in step S23, and writes it in a predetermined region of a frame memory 23, whereby it can be displayed in the top row on a CRT 24. The process proceeds to step S25.

[0066]

In step S25, the CPU 25a causes the CRT 24 to display additional information (not shown) included in the EPG extracted by the TV tuner 21 in the second top row on the CRT 24. The additional information relates to a program title, program contents, or a cast.

[0067]

The process proceeds to step S26, in which information on other programs (program information from broadcasting stations excluding the broadcasting station being received) is displayed on the CRT 24 in the order of channels.

[0068]

Fig. 12 shows an example of an image displayed on the CRT 24 as a result of processing in steps S24 to S26. In

this example the program information corresponding to broadcaster "ASAHI", which is program information corresponding to the broadcasting station being received, is displayed in the top row on the screen. In addition, under program names ("SUIYO SUSPENSE", "RYORI", and "SASURAI KEIJI KANJO-HEN"), program titles ("MIKKAINO SATSUJIN JIKEN" and "SHISANKA KIETA"), program contents ("KANINO MUSHI"), a cast (NAKAO, KIYO; MORIMOTO, REO; MATSUSHIMA, SHIN-ICHI; YOSHIDA, KAZUKO; NISHIDA, MAKOTO), and so forth, are displayed. Under broadcaster "ASAHI", program information from other broadcasters (or channels): "SOGO", "KYOIKU", and "NIPPON" are sequentially displayed.

[0069]

According to the above-described embodiment, program information from one broadcasting station being received is displayed in the top row, which enables the user to instantly refer to other programs from the broadcasting station.

[0070]

Fig. 13 is a block diagram showing a third embodiment of a receiving apparatus according to the present invention. Components in Fig. 3 corresponding to those shown in Fig. 4 are denoted by identical reference numerals for omitting descriptions.

[0071]

Compared with the first embodiment shown in Fig. 4, in the third embodiment shown in Fig. 13, the tag extractor 22 is excluded and a priority-station information generator 30 (recording means) is additionally provided. The structures of other components are identical to those shown in Fig. 4.

[0072]

The priority-station information generator 30 is used to generate a tag (e.g., "ASAHI") indicating a broadcasting station in cooperation with a manufacturer that produces or sells the receiving apparatus.

[0073]

The operation of the receiving apparatus according to the third embodiment will be described below, with reference to the flowchart shown in Fig. 14.

[0074]

When the process is executed, in step S40, a CPU 25a in a controller 25 determines whether or not a predetermined input for displaying an EPG has been provided from an input unit 26. As a result, if it is determined that the predetermined input has not been provided (NO), the process returns to step S40, in which the same processing is repeatedly performed. If it is determined that the predetermined input has been provided (YES), the process proceeds to step S41.

[0075]

In step S41, the CPU 25a acquires the priority station tag output from the priority-station information generator 30. The process proceeds to step S42, in which the CPU 25a extracts program information corresponding to the priority station tag from EPG data output from the TV tuner 21.

[0076]

In step S43, the CPU 25a enlarges the program information extracted in step S42 and writes it in a predetermined region of a frame memory 23, whereby it can be emphatically displayed in the top row on a CRT 24. In step S44, the CPU 25a uses the CRT 24 to display other program information in the order of channels.

[0077]

Here, when it is assumed that broadcaster "ASAHI" is in cooperation with the manufacturer producing the receiving apparatus and that the priority-station information generator 30 generates "ASAHI" as a priority station tag, the image shown in Fig. 6 is displayed on the CRT 24 as a result of display processing in steps S43 and S44. Accordingly, a possibility in which programs from the broadcasting station in cooperation with the manufacturer producing the receiving apparatus are watched can be increased.

[0078]

In the foregoing embodiments, an example of analog

terrestrial broadcasting has been described. However, the present invention is not limited to such a case but, needless to say, it may be applied to, for example, satellite broadcasting, digital broadcasting, or cable television.

[0079]

In this specification types of the transmission medium include not only information recording media such as a floppy disc and a CD-ROM but also network transmission media such as the Internet and a digital broadcasting satellite.

[0080]

[Advantages]

According to a receiving apparatus as set forth in Claim 1, a receiving method as set forth in Claim 8, and a transmission medium as set forth in Claim 9, an image signal is received, the received signal is output to a display, an EPG added to the received image signal is extracted, the display format of the EPG when it is displayed on the display is altered in accordance with predetermined information, and the altered EPG is displayed on the display. Therefore, program information from a broadcasting station providing the EPG is emphasized and displayed, which can increase a program rating of the broadcasting station.

[0081]

According to a transmitting apparatus as set forth in

Claim 11, a transmitting method as set forth in Claim 12, and a transmission medium as set forth in Claim 13, an image signal is generated, an EPG is generated, information representing a broadcasting station providing the EPG is generated, the generated EPG and the generated information representing the broadcasting station are added to the generated image signal, and the signal obtained by adding the EPG and the information representing the broadcasting station to the image signal is transmitted to a receiving end. Therefore, the EPG can be displayed from the receiving apparatus, using a display format advantageous to the broadcasting station providing the EPG.

[Brief Description of the Drawings]

[Fig. 1]

Fig. 1 is a block diagram showing an embodiment of a transmitting apparatus according to the present invention.

[Fig. 2]

Fig. 2 is a flowchart illustrating a process executed in the embodiment shown in Fig. 1.

[Fig. 3]

Fig. 3 is a view showing a provider-tag-added EPG.

[Fig. 4]

Fig. 4 is a block diagram showing an embodiment of a receiving apparatus according to the present invention.

[Fig. 5]

Fig. 5 is a flowchart illustrating a process executed in the embodiment shown in Fig. 4.

[Fig. 6]

Fig. 6 is an example of an image displayed on a CRT 24 as a result of executing the flowchart shown in Fig. 5.

[Fig. 7]

Fig. 7 is a normally displayed EPG image.

[Fig. 8]

Fig. 8 is an image displayed on a CRT 24 as a result of executing the flowchart shown in Fig. 5.

[Fig. 9]

Fig. 9 is a block diagram showing a second embodiment of a receiving apparatus according to the present invention.

[Fig. 10]

Fig. 10 is a flowchart illustrating a process executed in the embodiment shown in Fig. 9.

[Fig. 11]

Fig. 11 is a table showing the correspondence between receiving frequencies and channel IDs which are stored in a ROM 25b in Fig. 9.

[Fig. 12]

Fig. 12 is an image displayed on a CRT 24 as a result of executing the flowchart shown in Fig. 10.

[Fig. 13]

Fig. 13 is a block diagram showing a third embodiment

of a receiving apparatus according to the present invention.

[Fig. 14]

Fig. 14 is a flowchart illustrating a process executed in the receiving apparatus shown in Fig. 13.

[Reference Numerals]

2: editor (first generating means)

3: combining unit (adding means)

4: EPG generator (second generating means)

5: provider-tag generator (third generating means)

6: transmitter (transmitting means)

21: TV tuner (receiving means, extracting means)

23: frame memory (output means, second output means)

25a: CPU (alteration means)

30: priority-station tag generator (recording means)

[Name of Document] ABSTRACT

[ABSTRACT]

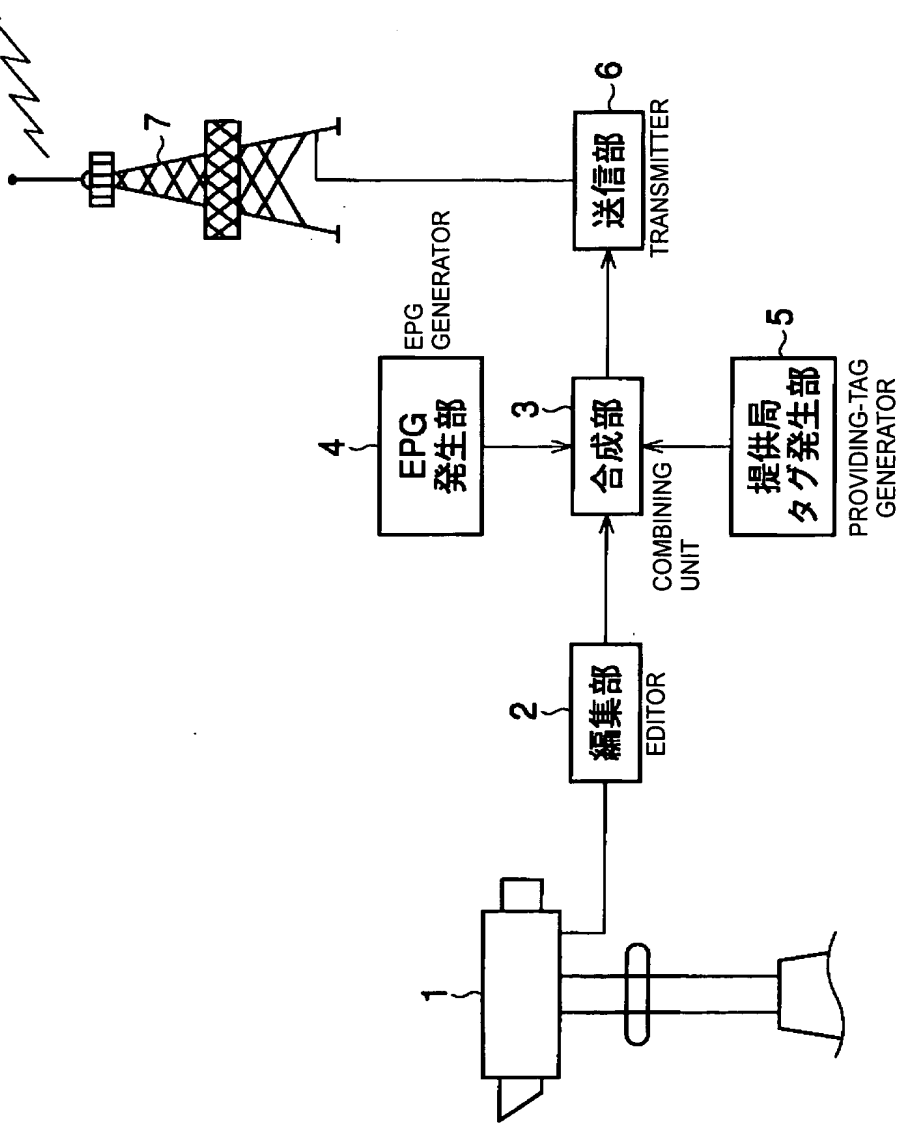
[Object] To display program information on a broadcasting station providing an EPG so that it is emphasized.

[Solving Means] From electric waves received by an antenna 20, a predetermined frequency signal is extracted by a TV tuner 21, and an EPG is extracted. From the EPG, a tag extractor 22 extracts a provider tag indicating a broadcasting station providing the EPG, and supplies it to a controller 25. From program information constituting the EPG data output from the tag extractor 22, the controller 25 selects program information from the broadcasting station corresponding to the provider tag extracted by the tag extractor 22, and writes the selected program information in a frame memory 23 so that it is emphasized. Other program information is written in the frame memory 23 so that it is normally displayed. As a result, only the program information providing the EPG is emphasized and displayed on a CRT 24.

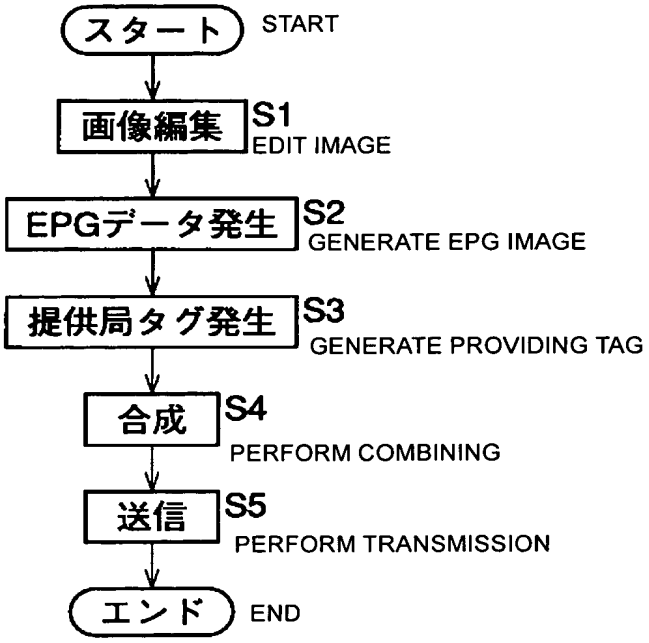
[Selected Figure] Fig. 4

【書類名】図面　[Name of Document] DRAWINGS

【図１】[FIG. 1]



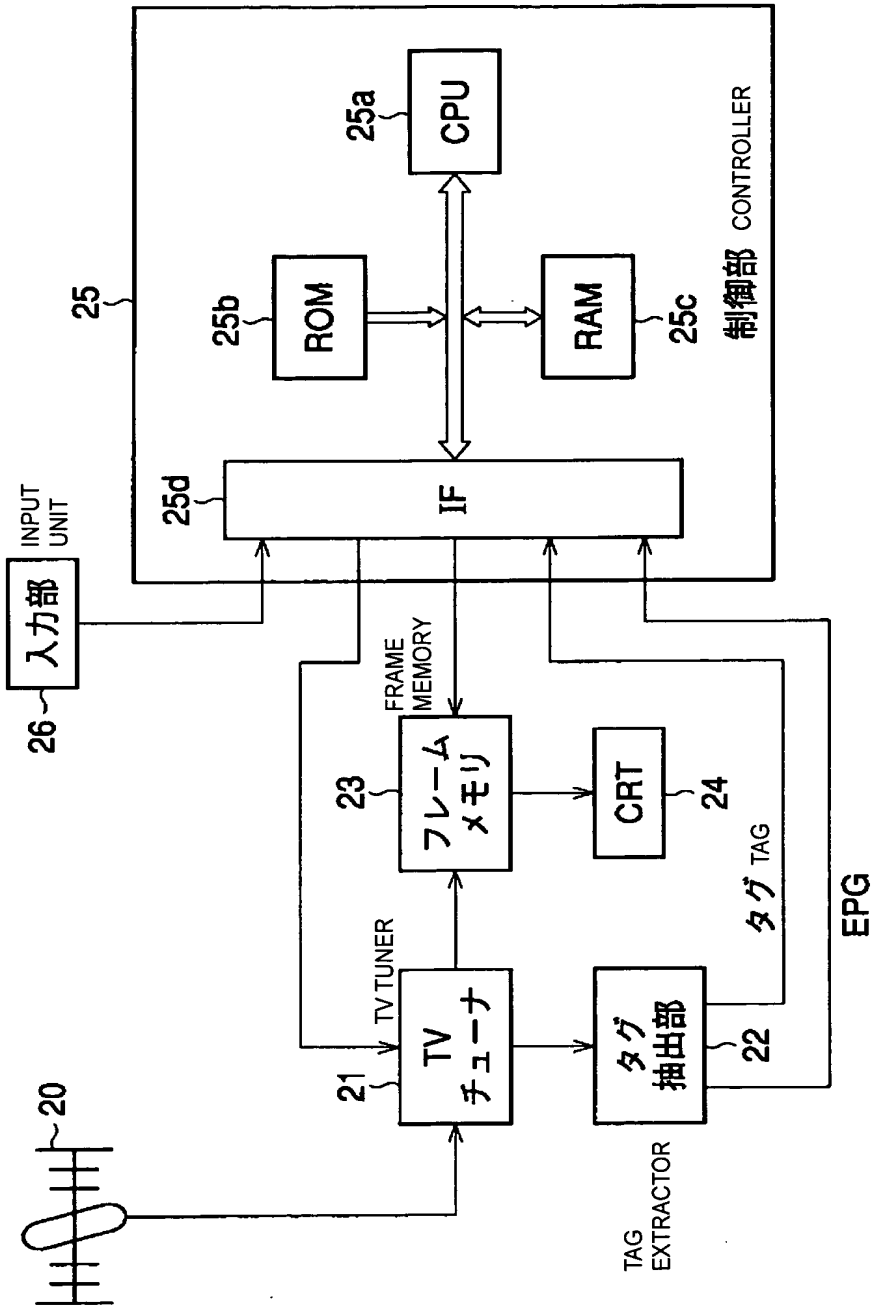
【図２】[FIG. 2]


スタート
START
画像編集
S1
EDIT IMAGE
EPGデータ発生
S2
GENERATE EPG IMAGE
提供局タグ発生
S3
GENERATE PROVIDING TAG
合成
S4
PERFORM COMBINING
送信
S5
PERFORM TRANSMISSION
エンド
END

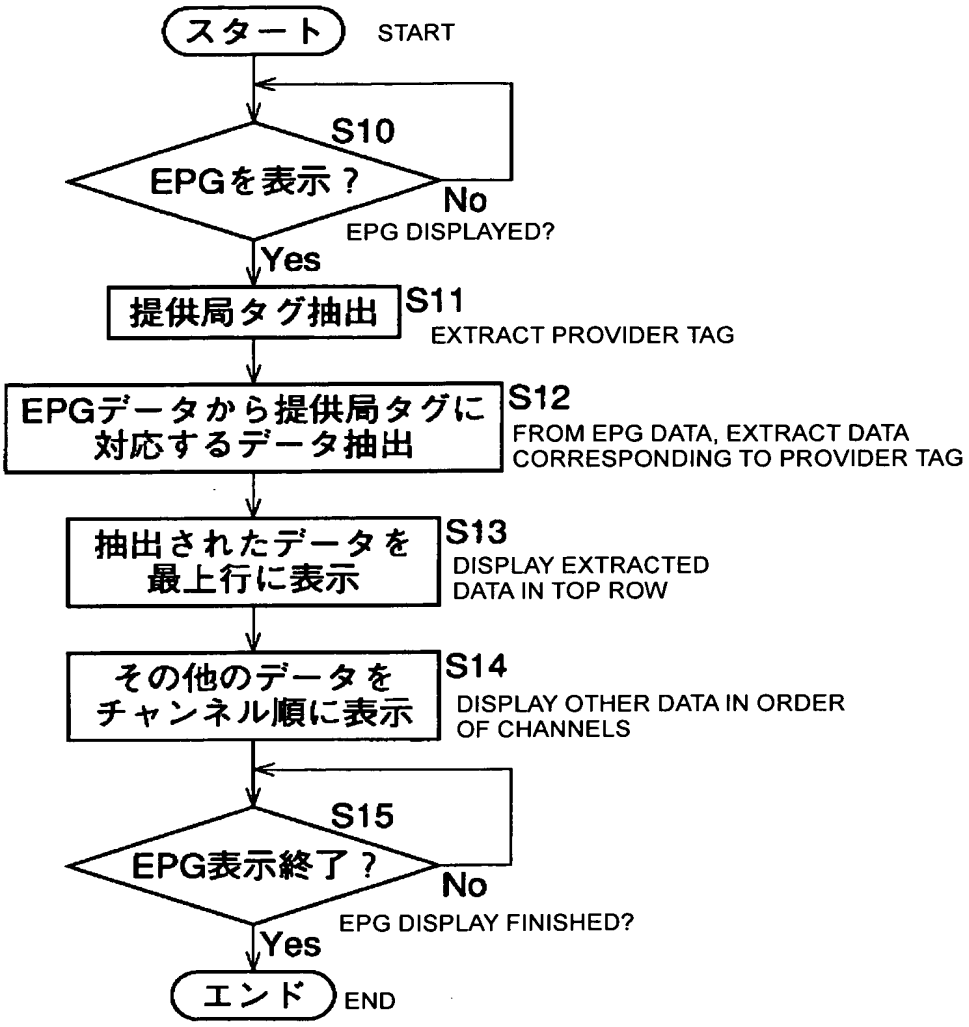
【図３】[FIG. 3]

＜提供局タグ＞ <PROVIDER TAG>
朝日 ASAHI
＜／提供局タグ＞<PROVIDER TAG>
＜放送ファイル１＞<BROADCAST FILE 1>
<BROADCAST DATE>DECEMBER 24, 1997, 16:00-16:10</BROADCAST DATE>
＜放送日＞１９９７．１２．２４．１６：００－１６：１０＜／放送日＞
＜放送局＞総合＜／放送局＞<BROADCASTING STATION>SOGO</BROADCASTING STATION>
＜番組名＞ＮＥＷＳ＜／番組名＞ <PROGRAM NAME>NEWS< /PROGRAM NAME >
＜／放送ファイル１＞ </BROADCAST FILE 1>
＜放送ファイル２＞ <BROADCAST FILE 2>
<BROADCAST DATE>DECEMBER 24, 1997, 16:00-16:10</BROADCAST DATE>
＜放送日＞１９９７．１２．２４．１６：００－１６：１０＜／放送日＞
＜放送局＞教育＜／放送局＞ <BROADCASTING STATION>KYOIKU</BROADCASTING STATION>
＜番組名＞うたはともだち＜／番組名＞ <PROGRAM NAME>UTAWATOMODACHI< /PROGRAM
＜／放送ファイル２＞ </BROADCAST FILE 2>
＜放送ファイル３＞ <BROADCAST FILE 3>
<BROADCAST DATE>DECEMBER 24, 1997, 16:00-16:30</BROADCAST DATE>
＜放送日＞１９９７．１２．２４．１６：００－１６：３０＜／放送日＞
＜放送局＞日本＜／放送局＞<BROADCASTING STATION>NIPPON</BROADCASTING STATION>
＜番組名＞銀河鉄道９９９＜／番組名＞ <PROGRAM NAME>GINGATETSUDO999< /PROGRAM
＜／放送ファイル３＞ </BROADCAST FILE 3>
＜放送ファイル４＞ <BROADCAST FILE 4>
<BROADCAST DATE>DECEMBER 24, 1997, 16:00-16:30</BROADCAST DATE>
＜放送日＞１９９７．１２．２４．１６：００－１６：３０＜／放送日＞
＜放送局＞東京＜／放送局＞<BROADCASTING STATION>TOKYO</BROADCASTING STATION>
＜番組名＞水戸黄門＜／番組名＞ <PROGRAM NAME>MITOKOMON< /PROGRAM NAME >
＜／放送ファイル４＞ </BROADCAST FILE 4>
＜放送ファイル５＞<BROADCAST FILE 5>
<BROADCAST DATE>DECEMBER 24, 1997, 16:00-16:30</BROADCAST DATE>
＜放送日＞１９９７．１２．２４．１６：００－１６：３０＜／放送日＞
＜放送局＞フジ＜／放送局＞ <BROADCASTING STATION>FUJI</BROADCASTING STATION>
＜番組名＞お料理がんばる＜／番組名＞ <PROGRAM NAME>ORYORI GANBARU< /PROGRAM
＜／放送ファイル５＞ </BROADCAST FILE 5>
＜放送ファイル６＞ </BROADCAST FILE 6>
<BROADCAST DATE>DECEMBER 24, 1997, 16:00-16:45</BROADCAST DATE>
＜放送日＞１９９７．１２．２４．１６：００－１６：４５＜／放送日＞
＜放送局＞朝日＜／放送局＞<BROADCASTING STATION>ASAHI</BROADCASTING STATION>
＜番組名＞水曜サスペンス＜／番組名＞<PROGRAM NAME>SUIYO SUSPENSE< /PROGRAM
＜／放送ファイル６＞ </BROADCAST FILE 6>

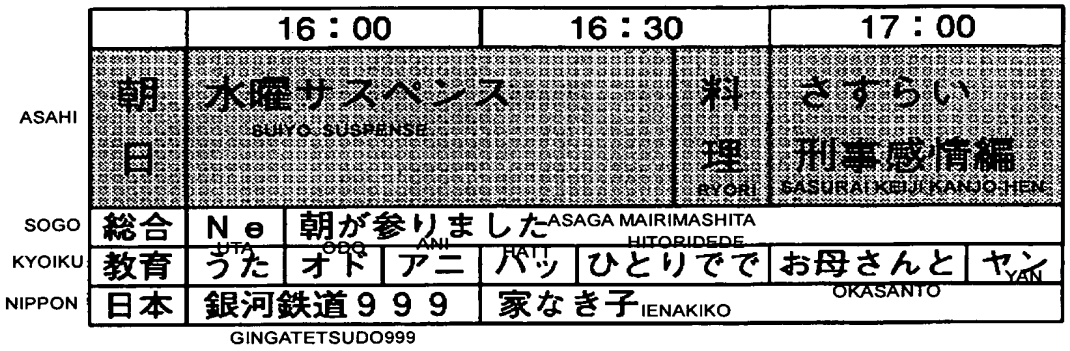
【図４】[FIG. 4]


25
25a
CPU
25b
ROM
RAM
25c
制御部 CONTROLLER
25d
IF
INPUT UNIT
入力部
26
FRAME MEMORY
23
フレームメモリ
CRT
24
TV TUNER
TV チューナ
21
タグ抽出部
22
タグ TAG
EPG
20
TAG EXTRACTOR

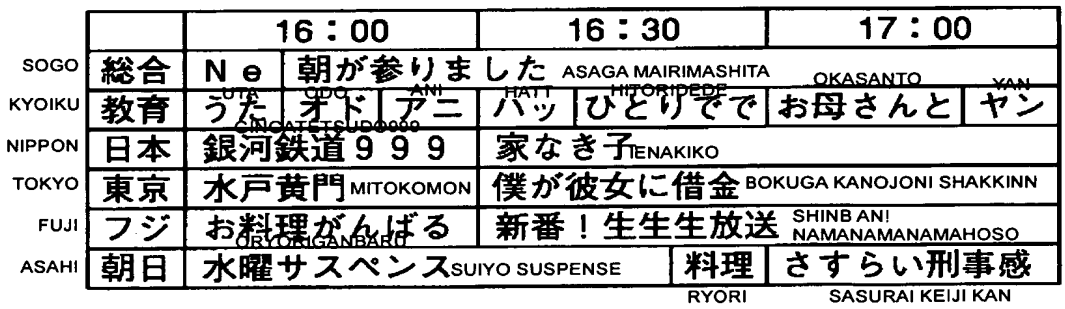
【図５】[FIG. 5]


スタート
START
S10
EPGを表示？
No
EPG DISPLAYED?
Yes
提供局タグ抽出
S11
EXTRACT PROVIDER TAG
EPGデータから提供局タグに対応するデータ抽出
S12
FROM EPG DATA, EXTRACT DATA CORRESPONDING TO PROVIDER TAG
抽出されたデータを最上行に表示
S13
DISPLAY EXTRACTED DATA IN TOP ROW
その他のデータをチャンネル順に表示
S14
DISPLAY OTHER DATA IN ORDER OF CHANNELS
S15
EPG表示終了？
No
EPG DISPLAY FINISHED?
Yes
エンド
END

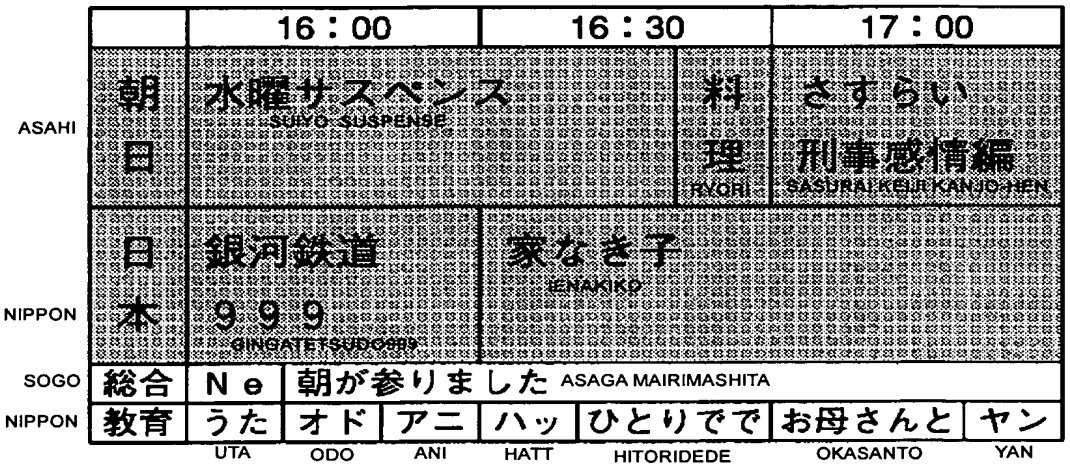
【図６】[FIG. 6]



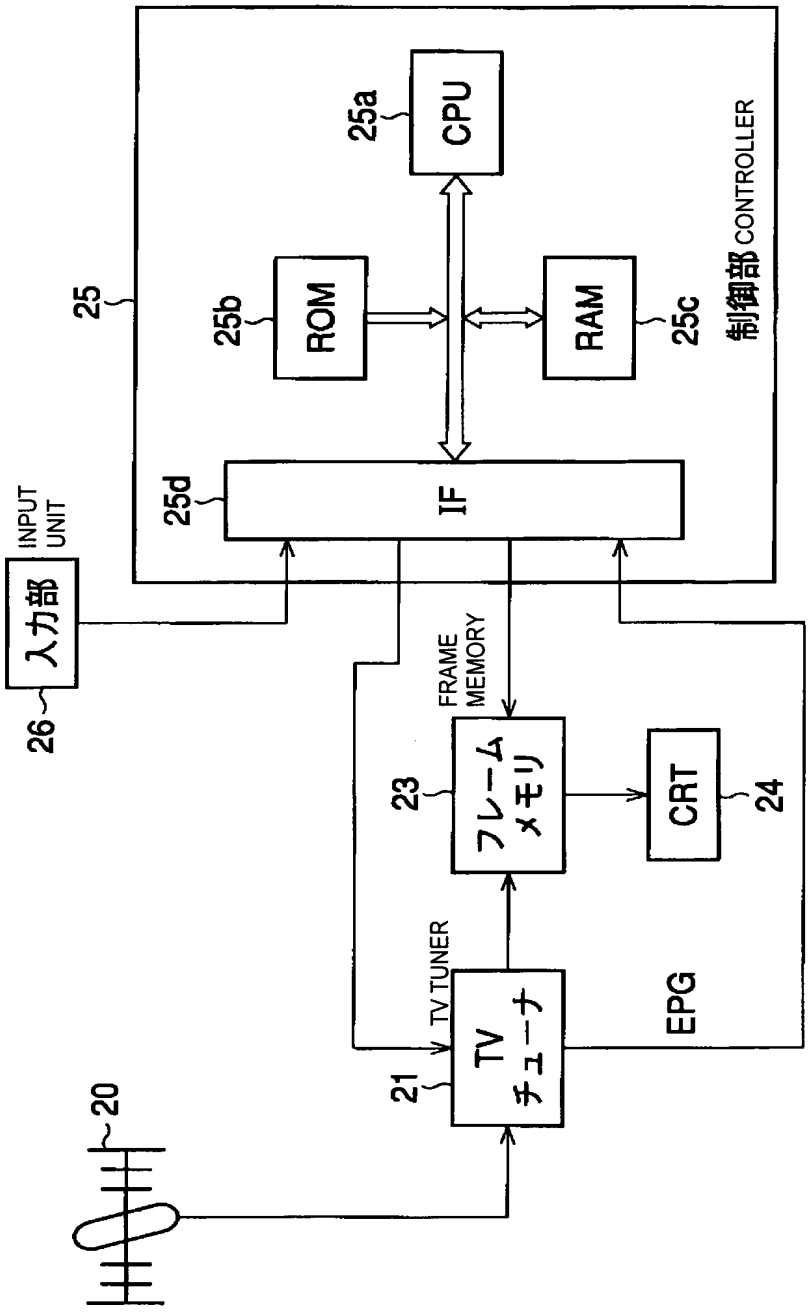
【図７】[FIG. 7]



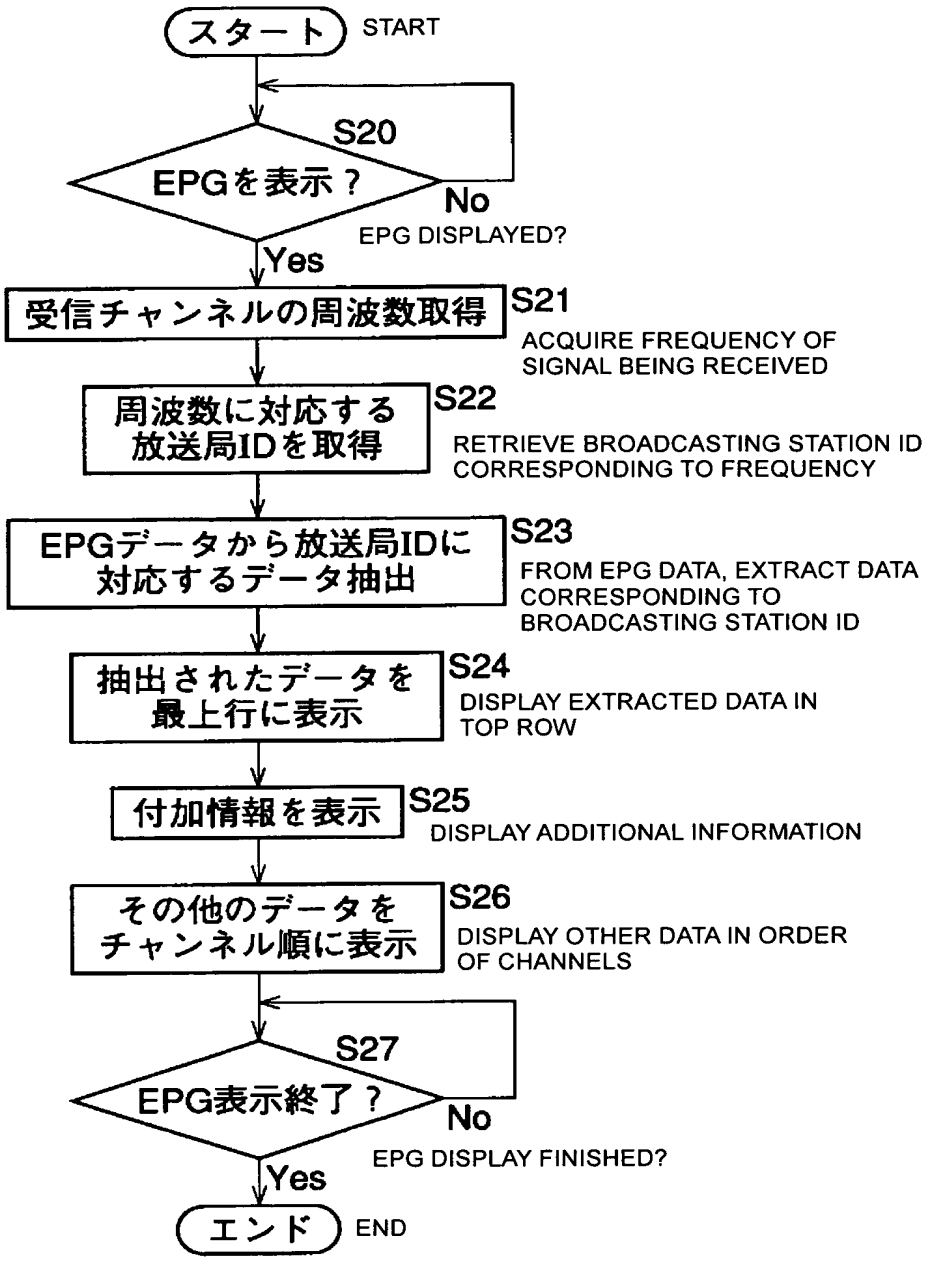
【図８】[FIG. 8]


16：00
16：30
17：00
ASAHI
朝日
水曜サスペンス
SUIYO SUSPENSE
料理
RYORI
さすらい
刑事感情編
SASURAI KEIJI KANJO-HEN
NIPPON
日本
銀河鉄道999
GINGATETSUDO999
家なき子
IENAKIKO
SOGO NIPPON
総合
Ｎｅ
朝が参りました ASAGA MAIRIMASHITA
教育
うた
UTA
オド
ODO
アニ
ANI
ハッ
HATT
ひとりでで
HITORIDEDE
お母さんと
OKASANTO
ヤン
YAN

【図９】[FIG. 9]


25
25a
CPU
25b
ROM
RAM
25c
制御部 CONTROLLER
25d
IF
INPUT UNIT
入力部
26
FRAME MEMORY
23
フレームメモリ
CRT
24
TV TUNER
TV チューナ
21
EPG
20

【図10】[FIG. 10]


スタート
START
S20
EPGを表示？
No
EPG DISPLAYED?
Yes
受信チャンネルの周波数取得
S21
ACQUIRE FREQUENCY OF SIGNAL BEING RECEIVED
周波数に対応する放送局IDを取得
S22
RETRIEVE BROADCASTING STATION ID CORRESPONDING TO FREQUENCY
EPGデータから放送局IDに対応するデータ抽出
S23
FROM EPG DATA, EXTRACT DATA CORRESPONDING TO BROADCASTING STATION ID
抽出されたデータを最上行に表示
S24
DISPLAY EXTRACTED DATA IN TOP ROW
付加情報を表示
S25
DISPLAY ADDITIONAL INFORMATION
その他のデータをチャンネル順に表示
S26
DISPLAY OTHER DATA IN ORDER OF CHANNELS
S27
EPG表示終了？
No
EPG DISPLAY FINISHED?
Yes
エンド
END

【図11】[FIG. 11]

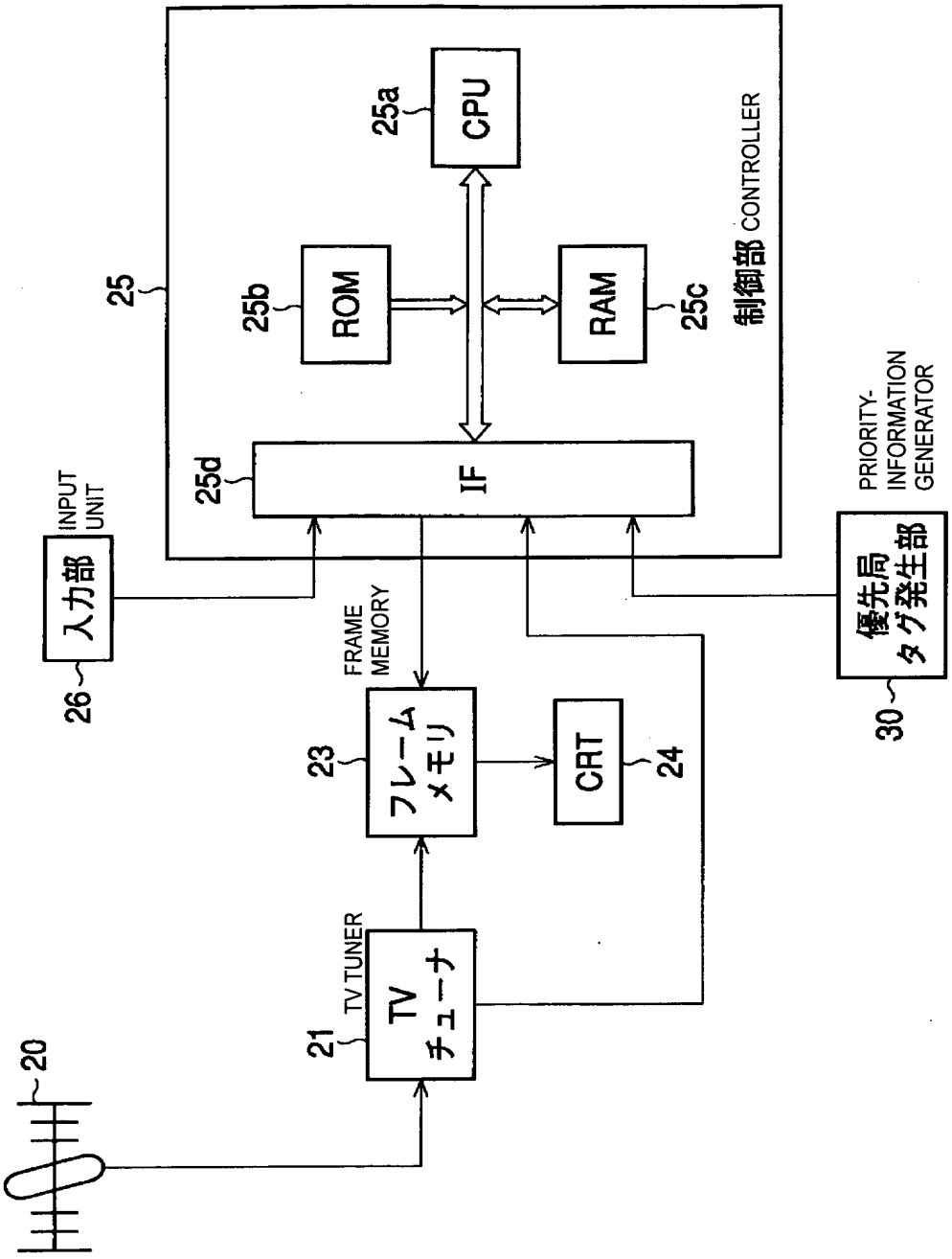
FREQUENCY

周波数	Channel ID	
90−96	総合	SOGO
102−108	教育	KYOIKU
170−176	日本	NIPPON
182−188	東京	TOKYO
192−198	フジ	FUJI
204−210	朝日	ASAHI

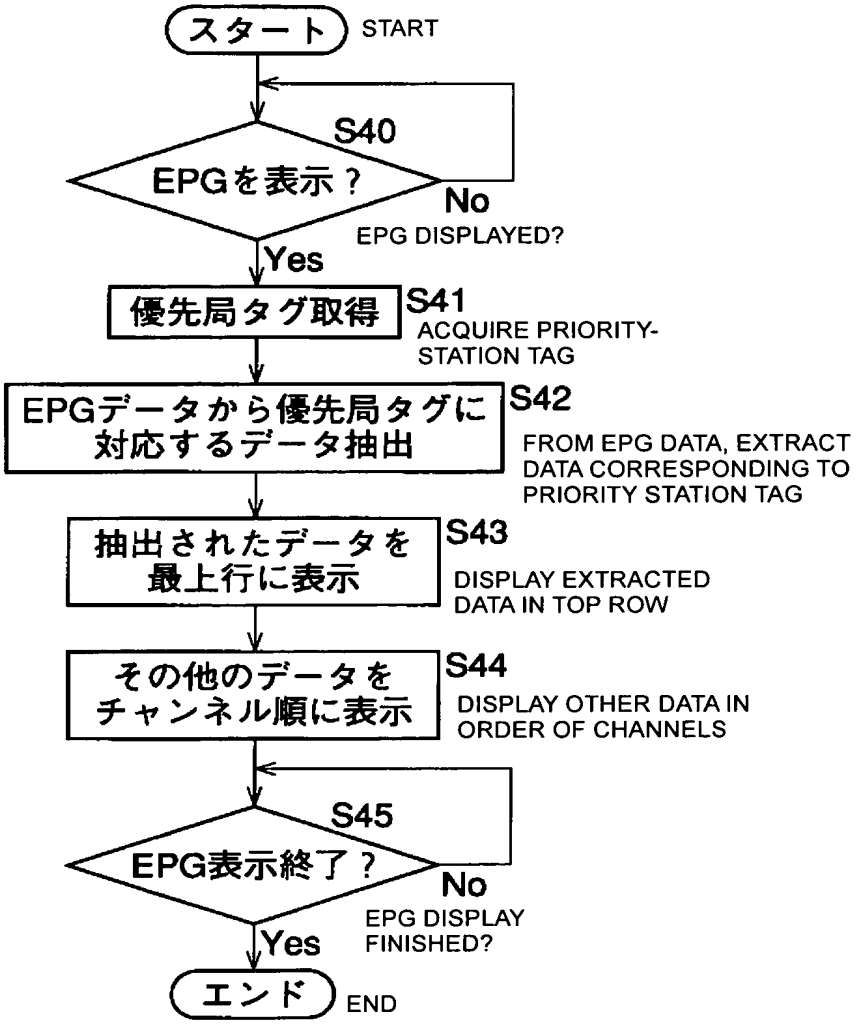
【図12】[FIG. 12]

		16：00		16：30		17：00	
ASAHI	朝日	水曜サスペンス「密会の殺人事件」中尾彬代 森下 松島眞一 吉田和子 SUIYO SUSPENSE MIKKAINO SATSUJIN JIKEN NAKAO AKIYO MORIMOTO REO MATSUSHIMA SHIN-ICHI YOSHIDA KAZUKO		料理かしの家 KASHINO IE		さすらい刑事 殺情編 SASURAI KEIJI KANJO HEN 「資産家消えた」	
SOGO	総合	Ｎｅ UTA	朝が参りました ASAGA MAIRIMASHITA				
KYOIKU	教育	うた	オド ODO アニ ANI	パッ HATT	ひとりでで HITORIDEDE	お母さんと OKASANTO	ヤン YAN
NIPPON	日本	銀河鉄道９９９ GINGATETSUDO999		家なき子 IENAKIKO			

【図13】[FIG. 13]


25
25a
CPU
25b
ROM
RAM
25c
制御部 CONTROLLER
25d
IF
INPUT UNIT
入力部
26
FRAME MEMORY
フレームメモリ
23
CRT
24
PRIORITY-INFORMATION GENERATOR
優先局タグ発生部
30
TV TUNER
TV チューナ
21
20

【図14】[FIG. 14]


スタート
START
S40
EPGを表示？
No
EPG DISPLAYED?
Yes
優先局タグ取得
S41
ACQUIRE PRIORITY-STATION TAG
EPGデータから優先局タグに対応するデータ抽出
S42
FROM EPG DATA, EXTRACT DATA CORRESPONDING TO PRIORITY STATION TAG
抽出されたデータを最上行に表示
S43
DISPLAY EXTRACTED DATA IN TOP ROW
その他のデータをチャンネル順に表示
S44
DISPLAY OTHER DATA IN ORDER OF CHANNELS
S45
EPG表示終了？
No
EPG DISPLAY FINISHED?
Yes
エンド
END